
Space Weather Forecast

Issued on Sunday 15 December 2024 at 01:09 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Isolated Minor/Moderate (R1/R2) radio blackouts likely at first.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low activity with a peak Common-class flare observed at 14/1729 UTC. There are four sunspot regions on the Earth-facing disc. A large region in the southwest saw weakening of its trailing spots, but also some merging of its leading spots, and was responsible for the largest flare mentioned above. A region in the south-centre disc is the most developmental at present, with a mature leading region, and numerous intermediate and trailing spots of smaller size. A region in the northwest has shown some decay.

No clear Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds showed an ongoing slow wind regime. Solar wind speeds were at background, typically varying between 300-350km/s. The Interplanetary Magnetic Field (IMF), Bt, was largely weak, but became moderate from around 14/0800 UTC. The north-south component, Bz, was mostly negative, becoming occasionally moderately negative from around 14/1330 UTC. The net result of the above solar wind measures was for Quiet to Unsettled geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is likely, with isolated Moderate-class flares. There is a slight chance of isolated Strong-class flares.

Solar Wind / Geomagnetic Activity: There are no clear Earth-directed CMEs as of the issue of this guidance.

Enhanced solar wind conditions are expected on Day 1 (15 Dec) due to a connection to a coronal hole high speed stream (HSS). Geomagnetic activity is expected to start mostly Unsettled as a result, then rising to give spells of Active conditions, with a slight chance of G1 Minor Storm intervals. Activity and solar winds expected to ease into the new working week, returning conditions to mainly Quiet.

Energetic Particles / Solar Radiation: There is a daily slight chance of S1/ Minor solar radiation storms or greater, in response to any notable flares.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	20	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	No	55	55	40	40
Very Active	R3-R5 (X Class)	No	10	10	5	5

Solar Radiation Storms (High Energy Protons)

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = cm ⁻² sr ⁻¹ s ⁻¹)						